November 21, 2005

State Farm Insurance Mr. Clark Martin, Claims Adjuster 1909 East Pass Rd. Gulfport, MS 39507

Insured: Mr. Minh Nguyen Date of Loss: 8-29-2005

SF Claim No. 24-Z451-170/24-CC-2102-7

Hurricane Damage Assessment Investigation

FAEC Case No: 530-0091-05-25

DEC 01 2005

Dear Mr. Martin.

Re:

Forensic Analysis & Engineering (FAEC) is pleased to provide the following report of our engineering investigation and evaluation of the reported damage to the subject residence located at 6613 Sundown Avenue in Biloxi, MS.

We initially received this assignment on October 4, 2005. FAEC performed a field investigation of the subject insured residence on October 25, 2005. In this assignment we were tasked to inspect the subject home to determine if wind or tidal surge damaged the residence.

This summary report is being submitted in fulfillment of our assignment in this matter.

## BACKGROUND

On the morning of August 29, 2005, the Mississippi coast, including the city of Biloxi, was impacted by Hurricane Katrina, which was classified as a Category-4 hurricane when it made landfall. The hurricane's winds and rising water caused excessive damage to structures along the gulf coast.

Hurricane Katrina also damaged weather stations and water level gauging stations along the Mississippi coast. Therefore, accurate wind and water level data are not available. In order to assist in evaluating damage, FAEC has synthesized data from the Hurricane Forecast Advisories and Hurricane Public Advisories available at noaa.gov, and from a report prepared for State Farm Insurance companies by Weather Data, Inc.

By interpolation, this data shows that at landfall wind speeds reached 115 to 130 miles per hour at Gulfport, Biloxi, Ocean Springs, Gautier, Pascagoula, and other areas east

# FORENSIC ANALYSIS & ENGINEERING CORPORATION

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Title: Hurricane age Assessment Investigation Insured: Minh Nguyen
Claim/Policy No.: 24-Z451-170/24-CC-2102-7
FAEC File No.: 530-0091-05-25

Page 2

of Gulfport. Winds at this level define a Category 3 storm on the Saffir/Simpson scale, and some structural damage to small residences and utility buildings, damage to roofing material, door and window failures, and a minor amount of curtainwall failures would be expected. The Weather Data, Inc. report indicates maximum winds at this location were approximately 100 to 110 miles per hour.

The Advisories also predicted storm surge and tidal flood levels of 18 to 22 feet, and up to 28 feet depending on local conditions. Considering currents and wave action, FAEC would expect flooding and wave or current damage at elevations up to 32 feet above mean sea level (MSL).

The Advisories also mention the possibility of tornados, and tornado warnings were issued, for the Waveland-Bay St. Louis area northward to Kiln and Diamondhead, however FAEC has not found any documentation or specific evidence that tornados actually occurred in this area.

The subject property appears to be within Flood Zone A9 (EL 12) on the Flood Insurance Rate Map Panel 2852560160D, and available topographic mapping of the area indicates ground elevations at the structure are between 5 and 10 feet above mean sea level (MSL).

FAEC performed a field investigation of the subject residence to determine if wind or tidal surge damaged the residence. Ms. Nguyen was not present for FAEC's inspection; however she was interviewed by phone. The sister of the insured, Ms. Minh Le, was present for the inspection. During our on site examination of the subject damage, FAEC was able to complete our inspection which acts as a basis of this report.

### SITE OBSERVATIONS

The following are the observations made during FAEC's inspection of the structure:

- This house was located in an area where there was almost complete devastation. The home was oriented so that the front faces east towards Sundown Ave. The house was approximately 200 yards northeast of a bayou leading to the Back Bay of Biloxi, and was demolished.
- The house was a one story structure.
- A neighbor, Mr. Toche, thought a tornado had come through the area as a
  "swath of destruction" was apparent to him. There appears to be a path of
  destruction starting at the corner of a street about ¼ mile to the southeast of the
  insured home then proceeding northeasterly through a steel framed building on a
  golf course and continuing northeasterly for several hundred yards past the
  insured home to a point near where a stand of pine trees remain.



Claim/Policy No.: 24-Z451-170/24-CC-2102-7

FAEC File No.: 530-0091-05-25

#### Page 3

- A house slab located three properties to the south of the insured had a number of exterior wall bottom plate anchor bolts remaining in the eastern wall area, and these had been bent in opposing directions.
- In a telephone conversation with Ms. Nguyen, she told of how she escaped from her house during the storm. She and seven others made their way to the north side of the attic. At some point, something that was driven by the wind collapsed the south side of the attic and walls below. Two Vietnamese men witnessed this and told her it was the house to the south of her which flew into the south side of her house. These two men assisted these people to the ground and out to Sundown Ave. Once on Sundown Ave. the people made their way north to Lemoyne Blvd. Ms. Nguyen stated that as she headed north, she looked back and saw entire houses demolished, and the south side of her house demolished. The water level in the street was about 2 ft. at this time, and she recalls that they went into the attic probably about mid morning, possibly about 8 or 9 am. Her daughter received a head injury that required about 30 stitches. The daughter was floated down the street to safety by lying flat on some kind of plywood, readily found, pushed by those people with her.
- Observations of properties in the general area indicate significant damage and there were numerous tree failures in the northwesterly direction.

#### CONCLUSIONS

Based on the information that has been presented to FAEC and evidence gleaned during our inspection, FORENSIC ANALYSIS & ENGINEERING CORPORATION has made the following conclusions concerning the damage to the structure:

- The tree failures in the northwesterly direction are the result of the winds out
  of the southeast from the approaching hurricane. There are signs of possible
  tornado activity in the localized area described above.
- There was wind damage to the structure of some degree, based upon the insured's statement.
- There is evidence of storm surge in the area.

It is the opinion of FAEC that the damage to the house was predominantly caused by wind.

Our stated opinion is also based on our knowledge that the Category-3 hurricane force winds were present in this area for several hours before the rising and wind driven water would have reached the subject home's position, and that the pattern of destruction and damage to steel structures along a linear area is typical of a tornado



Title: Hurricane nage Assessment Investigation Insured: Minh Nguyen

Claim/Policy No.: 24-Z451-170/24-CC-2102-7 FAEC File No.: 530-0091-05-25

Page 4

accompanying the hurricane. Based upon this information, FAEC concludes that the home's structure was severely damaged by the extended hurricane force winds and a probable tornado, then washed away from its foundation by the swath of the surging wind driven waves.

The conclusions and opinions presented in this report are based on the results of FAEC's field investigation of the subject residence, as well as our analysis of the available wind and localized water level data and upon all of the other associated information that we have gathered during the course of our investigation efforts to date. If additional information or facts become available which materially affect these stated conclusions and opinions, then, FAEC reserves the right to amend or change its opinions and conclusions as needed.



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Claim/Policy No.: 24-Z451-170/24-CC-2102-7

FAEC File No.: 530-0091-05-25

Page 5

It has been our pleasure to perform this structural engineering analysis for you. We trust that our efforts will meet with your approval and that this report meets its intended purpose. Please call if you have any questions concerning this report or if I or any of FORENSIC ANALYSIS & ENGINEERING CORPORATION'S staff can be of further support.

Respectfully submitted,

FORENSIC ANALYSIS & ENGINEERING CORPORATION

John B. Kelly, P.E.

Principal Structural Engineer

John B. Helly

As it is the practice of FAEC to emphasize and ensure the technical quality of its work through peer review, the content of this report has been reviewed by the undersigned to ensure that all stated conclusions and supporting facts are technically consistent and meet the requirements of current engineering and scientific principles.

FORENSIC ANALYSIS & ENGINEERING CORPORATION

William C. Forbes, PE, DEE

Senior Principal Engineer